Methods: Sixty-four consecutive patients (mean age 63.5 ± 14.8 years; 65.6% male) diagnosed to have tuberculous pericarditis were included. All patients underwent surgical treatment. Detailed echocardiographic examinations were performed before operation. Their clinical manifestations were analyzed from the medical recordings.
Results: After a median follow-up period of 5.37 ± 3.68 years (range 1 month to 15 years), there were 24 (37.5%) deaths among this cohort. We found that thickened pericardium observed by the echocardiography (95.8 vs. 45.0%, odds ratio [OR] 2.18, p <0.001) and initial symptoms of congestive heart failure (CHF) (79.2 vs. 40.0%, OR 1.81, p = 0.004) were more common among patients complicated with mortality. In addition, less frequent treatment with corticosteroids and shorter duration of anti-TB treatment were found among mortality patient group (20.8 vs. 65.0%, OR 0.51, p <0.001; 2.16 ± 3.85 vs. 7.11 ± 4.14 months, p <0.001). Multivariate Cox regression analysis showed that thickened pericardium was an independent and significant predictor of death (hazard ratio 2.38, p = 0.02) as were CHF symptoms (hazard ratio 2.39, p = 0.02), usage of corticosteroids (hazard ratio 0.45, p=0.04) and an anti-TB treatment duration longer than 6 months (hazard ratio 0.33, p = 0.001).
Conclusion: We conclude that the echocardiographic finding of thickened pericardium and symptoms of CHF can be survival predictors for tuberculous pericarditis. Combination usage of corticosteroids and anti-TB treatment longer than 6 months may improve the outcome of tuberculous pericarditis.

1109-106 Mitral and Tricuspid Inflow Velocities and Their Variation With Respiration Are Better Predictors of Cardiac Tamponade Than Right Atrial and Ventricular Collapse: A Combined Echocardiographic and Hemodynamic Study

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Background: Echocardiography has become crucial in the diagnosis of cardiac tamponade. Criteria assessing cardiac chamber inversion and respirophasic changes in mitral inflow (MI) and tricuspid inflow (TI) velocities have been used to diagnose cardiac tamponade, however there is often a discrepancy between the groups of signs. Previous studies have used various criteria for tamponade with a limited number of patients having invasive hemodynamics. We sought to determine which echocardiographic parameters best predict the hemodynamic changes of tamponade.
Methods: 60 patients who underwent trans-thoracic echo and subsequent pericardiocentesis (PC) with right heart catheterization were studied. Evidence of prolonged right atrial, right ventricular or left atrial (LA) inversion were assessed. Peak MI and TI velocities and their respiratory variation were examined. Right heart and pericardial pressures and the cardiac index (CI) pre and post PC were recorded.
Results: Respiratory variation in MI and TI was weakly but significantly correlated with pericardial pressure pre PC (MI and TI variation vs pericardial pressure: r= .32, p=.02 and r=.29,p=.04). MI variation was also correlated with CI pre PC (r= .45, p=.009). The MI and TI velocities were also predictive and better correlated with the CI pre PC. (MI and TI vs CI: r= .63, p<.001 and r=.63, p<.001 respectively). MI velocity predicted pericardial pressure(r=.34, p=.02), TI velocity did not. An inspiratory MI velocity >80 cm/s or TI velocity >70cm/s excluded a CI < 2.5litres/min. In contrast, there was no difference in pericardial pressure or CI pre PC in the group who had right atrial or ventricular inversion vs those who did not. Patients with LA inversion had a higher pericardial pressure (18.8±3.5 vs 13.2±2.3, p=0.008) and lower CI (2.10±0.6 vs2.97±0.3, p=0.02) than those without.
Conclusions: In pericardial effusions, respiratory variation in MI and TI is weakly predictive of pericardial pressure while MI variation predicts CI. MI and TI velocities are correlated with CI. LA inversion predicts lower CI and higher pericardial pressure however right atrial and ventricular collapse are not predictive of the degreeof these hemodynamic changes.

1109-107 Minimally Invasive Transdiaphragmatic Pericardial Shunting Assisted by Video Thoracoscope and Transesophageal Echocardiography

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Background: The first description of pericardio-peritoneal shunt with laparoscopic approach originates from the early nineties. Technical details were developed. The efficacy, and safety of this approach was tested.
Methods: Continuous transesophageal echocardiographic (TEE) control, supraumbilically introduced camera secured direct vision for trocars in the left and right hypochondrium of the patients in a modified lithotomy position was used. Grasping the diaphragm anterolaterally to the hiatus esophagei, the diaphragm-pericardium complex was cut through using a harmonic scalpel, creating a hole of 3-5 cm. Ten patients (mean age: 55.8 years, 7 male, 3 female) with significant amount of recurrent pericardial effusion were operated on using this technique. Eight of them suffered from malignant disease (6 lung, 1 colon, 1 breast cancer), uremia and pemphigus were the underlying diseases in the remaining two cases.
Results: Eight out of the ten procedures lasted less than 20 minutes. Tamponade was relieved in all cases immediately. All the windows have remained patent until death of the patients (3 cases with malignant disease) or are open currently (7 cases, 3-15 months follow-up). All but one patient were discharged on the day after the procedure.
Conclusion: Under transesophageal echocardiographic (2D and Doppler) control the procedure is safe, no drains are left behind. Elevated intrapericardial pressure pumps the fluid out and prevents spontaneous closure of the hole. The usage of ultracision minimizes the risk of epicardial injury, clips are not necessary. This technique seems to be ideal both as a palliation and as a sulution in non malignant cases, without adverse reactions.

1109-108 Diagnostic Tests Have Incremental Value in Predicting Clinical Outcomes in Constrictive Pericarditis

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Background: Echocardiography (Echo), computed tomography (CT) and cardiac catheterization (Cath) have proven value in diagnosing constrictive pericarditis (CP). The prognostic implications of test findings are however less evident.
Methods: Echo, CT and Cath studies of 211 patients with CP (57±15 yrs) who had pericardiectomy at Mayo Clinic were analyzed. Clinical predictors of postoperative (postop) death, late cardiovascular (CV) death, and recurrent CHF were identified, and Echo, CT and Cath variables entered stepwise into clinical models to assess incremental prognostic value. Echo variables included LV dimensions and ejection fraction, LA and RA volumes, mitral E/A ratio and deceleration time and inferior vena caval size. CT variables were calcified pericardium and maximum pericardial thickness. Cath variables included mean RA, RV and LV end-diastolic, pulmonary artery systolic and pulmonary capillary wedge pressures.
Results: Echo was performed in 197 pts (93%), CT in 142 (67%) and Cath in 112 (53%). There were 26 postop deaths, 21 late CV deaths and 59 CHF events over a median follow-up of 61 months. Clinical and test predictors of these outcomes are tabulated.

Event	Predictor	HR	95% CI	P
Postop death	Mediastinal irradiation	4.50	1.65-12.31	0.003
	Cath: Pulmonary capillary wedge pressure	1.92	1.07-3.42	0.028
	CT: Calcified pericardium	1.53	1.01-2.30	0.043
	Age at surgery	1.04	1.00-1.08	0.034
Late CV death	Mediastinal irradiation	6.37	2.48-16.38	<0.001
	History of coronary disease	4.30	1.71-10.81	0.002
	Atrial fibrillation	3.87	1.51-9.92	0.005
	NYHA class	3.53	1.41-8.89	0.007
	Echo: Mitral E wave deceleration time	1.85	1.12-3.04	0.019
CHF	Mediastinal irradiation	4.07	2.04-8.12	<0.001
	Atrial fibrillation	2.13	1.21-3.75	0.009
	Cath: Pulmonary artery systolic pressure	1.71	1.24-2.36	0.001
	CT: Calcified pericardium	1.40	1.12-1.76	0.004
	Age at surgery	1.03	1.01-1.05	0.002

HR=hazard ratio, CI=confidence intervals
Conclusions: Calcified pericardium, pulmonary hypertension and markedly elevated filling pressures are independently associated with adverse outcomes in CP. Their detection by current diagnostic modalities yields prognostic information incremental to clinical variables.

1109-133 The Role of Pericardioscopy and Epicardial Biopsy in Determination of the Etiological Treatment for Chronic Pericardial Effusions

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Background: Assessment of the etiology of pericardial disease has important therapeutic implications. The aim of this study was to evaluate the clinical efficacy and safety of etiology-specific intrapericardial treatment with cisplatin or triamcinolone.
Methods: Out of the registry of 260 pts undergoing pericardiocentesis, 42 pts with cytologically verified neoplastic pericardial effusion (PE) (Group 1) were selected for cisplatin treatment (single dosis of 30 mg/m2/24h). Further 84 pts with autoreactive chronic PE were treated intrapericardially with two different triamcinolone regimens (Group 2), triamcinolone 600 mg/m2/24h; Group 3, triamcinolone 300 mg/m2/24h). PE and pericardial/epicardial biopsy analyses included biochemistry, cytology, serology, microbiology, histology, immunohistology, and PCRs for microbial DNA/RNA.
Results: The following malignancies were established: lung cancer - 52.4%, breast cancer - 19.0%, Morbus Hodgkin - 4.8%, esophageal cancer - 2.4%, mesothelioma - 2.4%, colon cancer - 4.8%, and undifferentiated cancer of unknown origin - 14.3%. None of the pts intrapericardially treated with cisplatin died due to cardiac tamponade. Mortality due to non-cardiac tumor progression was 52.4% and 80.9%, after 3 and 6 months respectively. Cisplatin prevented recurrence of symptoms and a hemodynamically relevant PE during the first 3 months of the follow-up in 92.8% of the pts, and after 6-12 months in 83.3% of the pts. Triamcinolone treatment resulted in symptomatic improvement and prevented PE recurrence in 92.6% vs. 86.7% of the pts after 3 months and in 85.1% vs. 83.3% after 1 year in the Group 2 and Group 3 respectively (p>0.05). During the follow-up 29.6% of the pts developed transitory iatrogenic Cushing syndrome in the Group 1 vs. 13.3% in the Group 2 (p<0.05).
Conclusion: Intrapericardial treatment of neoplastic pericarditis with cisplatin significantly prevented recurrences of symptoms and PE during the follow-up of 12 months. Intrapericardial treatment of autoreactive chronic/recurrent PE with 300 mg/m2/24h of triamcinolone prevented recurrences of symptoms and relapses of PE equally effective as the 600 mg/m2/24h regimen.